Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 19 (2): 247–250
https://doi.org/10.15560/19.2.247

PENSOFT

First record of *Lasiurus* (*Aeorestes*) *villosissimus* (É. Geoffroy St.-Hilaire, 1806) (Chiroptera, Vespertilionidae) in San Juan province, Argentina

Lilen Sánchez-Castro[1,2,3*], Gustavo A. Rivero-Castro[1,3,4], Elias G. Ruiz-Estebes[1,2,3], Orlando G. A. Pastrán-López[1,2,3], Nicolas J. Maya-Perez[1,2,3], Araceli R. Leos[2,3]

1 Grupo de Investigación y Conservación de Murciélagos de Zonas Áridas, San Juan, Argentina • LSC: lilensanchezcastro3@gmail.com https://orcid.org/0000-0002-2057-2917 • GARC: grivero@unsj-cuim.edu.ar https://orcid.org/0000-0003-0431-1458 • EGRE: elias16147@gmail.com https://orcid.org/0000-0002-2652-5759 • OGAPL: grabielpl11@gmail.com https://orcid.org/0000-0001-7041-6026 • NJMP: mayanicolasj@gmail.com https://orcid.org/0000-0003-1520-9600

2 Departamento de Biología, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de San Juan – Complejo Universitario Islas Malvinas, San Juan, Argentina • ARL: ara.leos.96@gmail.com https://orcid.org/0000-0002-2042-6178

3 Programa de Conservación de los Murciélagos de Argentina, San Miguel de Tucumán, Tucumán, Argentina

4 Centro de Investigación de la Geósfera y la Biósfera, Universidad Nacional de San Juan – Complejo Universitario Islas Malvinas y Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), San Juan, Argentina

* Corresponding author

Abstract. We report the first record of *Lasiurus villosissimus* (É. Geoffroy & St.-Hilaire, 1806) in San Juan province, Argentina. A male, determined as a juvenile by its degree of ossification of the epiphyses of the phalanges and the color and texture of the fur, was found on 31 August 2021 in a suburban area 2.44 km south of the city of San Juan. This new report increases the richness of bat species in the province and expands the distribution of this species towards the west of the country.

Keywords. Central-western Argentina, distribution, Large Frosted Bat

Academic editor: Annia Rodríguez-San Pedro
Received 9 June 2022, accepted 27 January 2023, published 19 April 2023

Sánchez-Castro L, Rivero-Castro GA, Ruiz-Estebes EG, Pastrán-López OGA, Maya-Perez NJ, Leos AR (2023) First record of *Lasiurus* (*Aeorestes*) *villosissimus* (É. Geoffroy St.-Hilaire, 1806) (Chiroptera, Vespertilionidae) in San Juan province, Argentina. Check List 19 (2): 247–250. https://doi.org/10.15560/19.2.247

Introduction

Lasiurus (*Aeorestes*) *villosissimus* (É. Geoffroy St.-Hilaire, 1806) (Chiroptera, Vespertilionidae) is a vespertilionid bat which occurs in Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Paraguay, Peru, Uruguay, and Venezuela (Díaz et al. 2021). Based on its feeding habits, *Lasiurus villosissimus* is characterized as an insectivore (Gardner and Handley 2007; Barquez and Díaz 2020). It is solitary and uses leaves and tree branches as refuges (Gardner and Handley 2007; Barquez and Díaz 2020). This species has long been considered a subspecies of *L. cinereus* (Beauvois, 1796) (Barquez et al. 1999; Gardner and Handley 2007), but molecular studies by Baird et al. (2015, 2017) have confirmed its status as a separate species, and Baird et al. placed both within the genus *Aeorestes* Fitzinger, 1870. However, some authors still consider it *Aeorestes* to be a subgenus, and other authors recommend the use its traditional placement in *Lasiurus* (Ziegler et al. 2016; Novaes et al. 2018). In this work, we use the traditional name.

Lasiurus villosissimus is currently categorized as Least Concern both globally (Gonzales et al. 2016) and nationally in Argentina (Díaz and Barquez 2019). In Argentina, *L. villosissimus* has been recorded in the provinces of Buenos Aires, Catamarca, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Neuquén, Río Negro, Salta,

©The authors. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

San Luis, Santa Fe, Santiago del Estero, and Tucumán (Barquez and Díaz 2020; Giménez and Schiaffini 2020; Fig. 1). This species is known to inhabit several ecoregions: the Andean-Patagonian Forests, the Dry Chaco, islands of the Parana Delta, the Espinal, the Patagonian steppe, the Plains and Plateaus Monte, Monte de Sierras and Bolsones, Pampa, Paranaense, Puna, and Yungas (Barquez and Díaz 2020). Also, it is likely to be found in Fields and Scrublands (Barquez and Díaz 2020).

The first records of chiropterans in San Juan province were reported by Barquez et al. (1993), Mares et al. (1995), and Barquez et al. (1999), who identified the presence of *Desmodus rotundus* (É. Geoffroy & St.-Hilaire, 1810) (Phyllostomidae), the *Tadarida brasiliensis* (I. Geoffroy & Saint-Hilaire, 1824) (Molossidae), and *Histiotus macrotus* (Poeppig, 1835), *Lasiurus blossevillii* (Lesson, 1826), and *Myotis dinellii* Thomas, 1902 (Vespertilionidae). Later, Sanabria and Quiroga (2001) and Sanabria et al. (2004) broadened the distribution of these species, except for *D. rotundus*, in the province. Recently, Barquez et al. (2016) recorded for the first time the vespertilionid *H. montanus* (Philippi & Landbeck, 1861) in San Juan. Here, we report the first record of *L. villosissimus* in San Juan province.

Methods

This work is part of the research project "Conociendo a los murciélagos de San Juan". On 31 August 2021 we were informed via phone by students from Centro Polivalente de Artes School about the occurrence of a bat perched on a branch of a *Jacaranda mimosifolia* D.Don (Bignoniaceae), 1.85 m above ground level, within the school's area (Fig. 1), which is located in the urban area of San Juan city, in San Juan province, central-western Argentina (Fig. 2). The vegetation in the area mainly consists of alien species characterized by deciduous leaves, such as *Morus alba* L., *Platanus ×hispanica* Mill. ex Münchh., and *Melia azedarach* L. (Moreno et al. 2008). This area is part of the ecoregion Monte de Sierras and Bolsones (Márquez et al. 2016), and about 75% of its surface is covered by mountain ranges running from north to south and separated by vast intermontane valleys (Marquez et al. 2016; Peralta 2016). These mountainous formations, their variation along different altitudinal gradients, and the arid climatic conditions of the area contribute to the development of its particular flora and fauna (Marquez et al. 2016; Peralta 2016).

The captured specimen was identified by comparing its external morphological traits with descriptions provided by Barquez and Díaz (2020) and with the assistance of the specialist Dr. Monica Díaz. It was collected by hand, and the following external measurements were recorded with digital calipers, with an accuracy of 0.05 mm, following Barquez et al. (1999): total length, tail length, hindfoot length, ear length, and forearm length. We followed the protocols of minimal handling for bat management from Mitchell-Jones and McLeish (2004). The specimen was photographed and released (Fig. 3). Permission for the research was secured from local authorities (Dirección de Conservación y Áreas Protegidas of San Juan).

Figure 1. Juvenile male of *Lasiurus villosissimus* perched on a *Jacaranda mimosifolia* in Centro Polivalente de Arte School, San Juan, Argentina. (Photograph: Elias Ruiz Estebes).

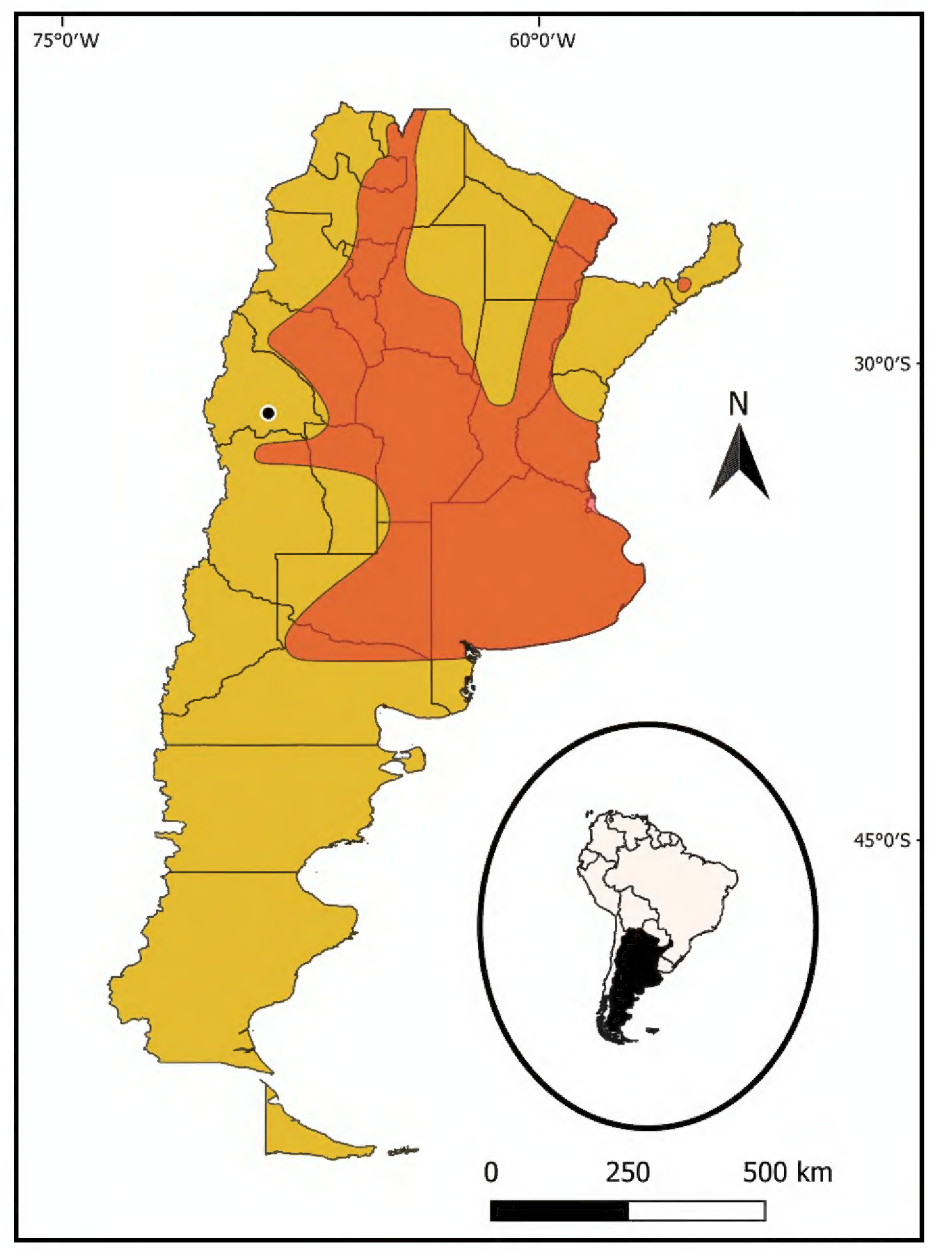

Figure 2. Distribution map of *Lasiurus villosissimus* in Argentina (red-colored area). The black circle shows the area of its new occurrence (31°33″30.52″S, 068°31′17.08″W) in San Juan city (modified version of the original map of Barquez and Díaz 2020).

Results

New record. ARGENTINA – San Juan • Capital, Centro Polivalente de Arte School; 31°33′30.52″S, 068°31′17.08″W; 628 m elev.; 31.XIII.2021; specimen collected by Lilen Sánchez Castro, specimen captured manually, 1 ♂.

Identification. In the city of San Juan, another *Lasiurus* species is known to occur (Barquez and Diaz 2020), *L. blossevillii* (Lesson, 1826), in which ears and face are light colored. In *L. villosissimus*, the ears and face are dark colored, and the ears are significantly larger (Table 1) than in *L. blossevillii*. Another similar species in Argentina is *Lasiurus* (*Dasypterus*) *ega* Gervais, 1856, which is as large as *L. villosissimus* (Table 1) and has short, rounded ears, with a predominantly olive-yellowish coat. In *L. villosissimus*, the ears are rounded and dark-colored with frosted fur. A further distinctive feature of *L. villosissimus* is that it exhibits spots of light-colored fur on the joints of the upper arm and the forearm, characteristics not found in either *L. blossevillii* or *L. ega*. Also, the distal margin of the uropatagium is well-furred in *L. villosissimus*, with hairs extending as far as the distal edge (Barquez and Díaz 2020).

Discussion

In Argentina, *Lasiurus villosissimus* occurs mainly in the north-central region of the country, occurring in 17 provinces (Díaz and Barquez 2019). The occurrence of this species in San Juan was not unexpected, as it has been previously reported in all neighboring provinces (Díaz and Barquez 2019; Barquez and Díaz 2020). In San Juan, fewer species of bats are known (Barquez and Díaz 2020), as there have been fewer studies (Barquez et al. 1993; Mares et al. 1995; Barquez et al. 1999; Sanabria and Quiroga 2001; Sanabria et al. 2004; Barquez et al. 2016). Our study increases to seven the species richness of bats in San Juan and also partially fills the gap in the known distribution of *L. villosissimus* in north-western Argentina.

Lasiurus villosissimus inhabits both natural as well as, suboptimally, urban and suburban habitats (Díaz and Barquez 2019). Populations of this species have been affected by habitat destruction and fragmentation in northern Argentina and Patagonia, and by the presence of wind turbines, which force these bats to modify their migratory routes (Díaz and Barquez 2019).

New records of *L. villosissimus* are useful to set a baseline for determining population status and migratory routes and to support management actions to promote bat conservation in Argentina (Díaz and Barquez 2019). Further research is required into the reproduction and feeding habits of this species, which

Figure 3. Captured specimen of *Lasiurus villosissimus*, ventral view. (Photograph: Elias Ruiz Estebes).

Table 1. Measurements of *Dasypterus ega*, *Lasiurus blossevillii*, *Lasiurus villosissimus* (from Barquez et al.1999) and the captured specimen.

Measurement	*Dasypterus ega* (*n* = 42)	*Lasiurus blossevillii* (*n* = 70)	*Lasiurus villosissimus* (*n* = 63)	Captured specimen (*n* = 1)
Total length	106.0–132.0	92.0–112.0	119.0–135.0	113.2
Tail length	43.0–68.0	44.5–52.0	44.0–65.0	55.5
Hindfoot length	6.0–11.5	7.0–9.0	7.5–11.2	8.8
Ear length	14.0–20.0	8.0–11.6	15.0–19.5	13.5
Forearm length	43.2–51.0	37.7–41.3	50.2–56.0	48.8

are largely unknown throughout South America (Díaz and Barquez 2019). Finally, we consider important to promote participation in citizen-science research projects to provide records of fauna in regions with limited information.

Acknowledgements

We thank students and members of the Board of Directors of Centro Polivalente de Arte Schoolfor providing us information about the specimen. We thank Departamento de Biología of Facultad de Ciencias Exactas, Físicas y Naturales of Universidad Nacional de San Juan, for financial support towards the cost of publication. We are most grateful to Monica Díaz and Rubén Barquez for their valuable comments and suggestions to improve the manuscript and for their assistance in the identification of the captured specimen. We thank the reviewers for their comments and suggestions on the document.

Author Contributions

Conceptualization: GRC, ERE, LSC, OGAPL, NM. Data curation: GRC, ERE, LSC. Funding acquisition: OGAPL, NM, ARL. Investigation: GRC, ERE, LSC, OGAPL, NM, ARL. Supervision: GRC, ERE, LSC. Writing–original draft: GRC, ERE, LSC, OGAPL, NM, ARL. Writing – review and editing: GRC, ERE, LSC, OGAPL, NM, ARL.

References

Alurralde SG, Sánchez RT, Barquez RM, Díaz MM (2016) New records of bats (Chiroptera, Mammalia) from Argentina. Check List 12 (2): 1873–1873. https://doi.org/10.15560/12.2.1873

Baird AB, Braun JK, Engstrom MD, Holbert AC, Huerta MG, Lim BK, Bickham JW (2017) Nuclear and mtDNA phylogenetic analyses clarify the evolutionary history of two species of native Hawaiian bats and the taxonomy of *Lasiurini* (Mammalia: Chiroptera). PLoS ONE 12 (10): e0186085. https://doi.org/10.1371/journal.pone.0186085

Baird AB, Braun JK, Mares MA, Morales JC, Patton JC, Tran CQ, Bickham JW (2015) Molecular systematic revision of tree bats (*Lasiurini*): doubling the native mammals of the Hawaiian Islands. Journal of Mammalogy 96 (6): 1255–1274. https://doi.org/10.1093/1171864

Barquez RM, Díaz MM (2020) Nueva guía de los murciélagos de Argentina. Con la colaboración de Montani ME, Perez MJ. Publicación Especial Nº 3, Programa de Conservación de los Murciélagos de Argentina (PCMA), Tucumán, Argentina, 183 pp.

Barquez RM, Giannini NP, Mares MA (1993) Guide to the bats of Argentina. Special publication of the Oklahoma Museum of Natural History. University of Oklahoma, Norman, USA, 119 pp.

Barquez RM, Mares MA, Braun JK (1999) The bats of Argentina. Special Publications of the Museum of Texas Tech University, Lubbock, USA, 259 pp.

Díaz MM, Barquez RM (2019) *Lasiurus* (*Aeorestes) villosissimus.* In: SAyDS-SAREM (ed.) Categorización 2019 de los mamíferos de Argentina según su riesgo de extinción. Lista Roja de los mamíferos de Argentina. http://cma.sarem.org.ar. Accessed on: 2021-10-21.

Díaz MM, Solari S, Gregorin R, Aguirre LF, Barquez RM (2021) Clave de identificación de los murciélagos Neotropicales—Chave de identificação dos morcegos neotropicais. Publicación Especial No 4 - PCMA (Programa de Conservación de los Murciélagos de Argentina), Tucumán, Argentina, 211 pp.

Gardner AL, Handley Jr CO (2007) Genus *Lasiurus Gray*, 1831. In: Gardner AL (Ed.) Mammals of South America: marsupials, xenarthrans, shrews, and bats. The University of Chicago Press, Chicago, USA, 457–468.

Giménez AL, Schiaffini MI (2020) Patagonian bats: new size limits, southernmost localities and updated distribution for *Lasiurus villosissimus* and *Myotis dinellii* (Chiroptera: Vespertilionidae). Mammalia 84 (2): 150–161. https://doi.org/10.1515/mammalia-2019-0024

Gonzalez E, Barquez R, Arroyo-Cabrales J (2016) *Lasiurus cinereus.* The IUCN Red List of threatened species 2016: e.T11345A22120305. https://doi.org/10.2305/iucn.uk.2016-1.rlts.t11345a22120305.en. Accessed on: 2022-05-21.

Kunz TH, Parsons S (2009) Ecological and behavioral methods for the study of bats. 2nd edition. The Johns Hopkins University Press, Baltimore, USA, 879 pp.

Mares MA, Barquez MR, Braun JK (1995) Distribution and ecology of some Argentine bats (Mammalia). Annals of the Carnegie Museum 64: 219–237. https://doi.org/10.15560/12.2.1873

Marquez J, Martinez Carretero E, Dalmasso A (2016) Provincias fitogeográficas de la provincia de San Juan. In: Martínez Carretero E, García A (Eds.) San Juan ambiental. Editorial Universidad Nacional de San Juan, San Juan, Argentina, 187–197.

Mitchell Jones AJ, McLeish AP (2004) Bat workers manual. 3rd edition. Pelagic Publishing, Exeter, UK, 178 pp.

Moreno G, Martínez Carretero E, Faggi AM, Vento B (2008) Sedimentación atmosférica seca en hojas de *Morus alba* L: En la ciudad de San Juan, Argentina. Interciencia 33: 844–849.

Novaes RLM, Garbino STG, Cláudio VC, Moratelli R (2018) Separation of monophyletic groups into distinct genera should consider phenotypic discontinuities: the case of *Lasiurini* (Chiroptera: Vespertilionidae). Zootaxa 4379 (3): 439–440. https://doi.org/10.11646/zootaxa.4379.3.8

Peralta SH (2016) Aspectos geológicos de la provincia de San Juan. In: Martínez Carretero E, García A (Eds.) San Juan ambiental. 1er edición, Mendoza, Argentina, 73–93.

Sanabria EA, Quiroga LB (2001) *Myotis levis* (Chiroptera: Vespertilionidae) para la provincia de San Juan, Argentina. Nótulas Faunísticas (Segunda Serie) 5: 1.

Sanabria EA, Quiroga LB, Villavicencio J, Cánovas G (2004) Lista comentada y estado de conservación de algunos quirópteros de la provincia de San Juan, Argentina. Nótulas Faunísticas (Segunda Serie) 17: 1.

Ziegler AC, Howarth FG, Simmons NB (2016) A second endemic land mammal for the Hawaiian Island: a new genus and species of fossil bat (Chiroptera: Vespertilionidae). American Museum Novitates 2016 (3854): 1–52. https://doi.org/10.1206/3854.1